



## Accompany with waste management companies: Biogas and waste treatment

**An entrepreneur from Dusseldorf recognized ten years ago that biogas production and waste treatment are complementary. Since he has turned his idea of a lasting utilization cycle, something has done itself on the farm of Hans-Gerd Buschhaus.**

From the beginning, it was clear, that Hans-Gerd Buschhaus' planned biogas plant would utilize food waste. This idea was very progressive for 2001. A biogas production solely on the basis of secondary raw and residual materials – with no energy crops whatsoever? Is this profitable? The economically-thinking farmer from Grefrath, along with his son Andre Buschhaus, has realized his vision and can now look back at more than 18 years of successful operation. The cooperation with a local waste management enterprise in 2013 was an initiative of his son Andre, providing savings for long-term economic success.

A variety of food waste from canteens, restaurants and food markets is delivered by truck. A storage facility is used for receiving and temporary storage of the delivery until the mechanical processing. Up to 1, 000 tons monthly is directed into the depackaging machine. The depackaging machine operates approximately four to eight hours daily, reports Andre Buschhaus. This machine reliably separates the digestible content from other packaging components, thereby speeding up their process. The operator proudly reports that “extraneous material is barely existent”. After pasteurization, the residue materials are supplied to the fermentation process. As the pasteurizer works at up to 70 degree Celsius the residue materials can be used as high-grade fertilizer.

But why does he operate such a machine like this? The operator explains the choice to use this technology: “From the beginning we were a part of a big supply chain of the waste logistic sector, and the origin of the input materials of our biogas plant

### AT A GLANCE

**Operator:** Family Buschhaus

**Farm:** Waste to Energy

**Location:** Municipality Grefrath, Germany

**Why Biogas?**

Existing substrates are profitable in use and in a natural cycle.

**How to use the heat?**

The biogas heat will be used amongst others for the pasteurization, also for their own house, a mushroom cultivation, abbey, two market gardens, a Café as well as an estate. They will be provided by a 6 km long-distance heat line.

wasn't always known. In addition, we had extreme variations in quality of the material, most of the delivered batches were defatted before. This had a negative effect on the gas yield, and therefore the whole efficiency of the biogas plant. To be able to guarantee a better control of the utilization cycle, we decided to invest in depackaging technology.” The ability to process packaged food in this way has allowed the owners to begin receiving larger quantities, in the form of palette loads.

The development of the partnership with the local waste management companies has been very successful over the years. From Drehkopf GmbH & Co. KG they obtain additional waste, which is much closer in location, allowing for higher efficiency, more climate protection and



added value to their region recycling program.

Following these innovations, the owner also invested in a garbage can washing system. The owners now clean approximately 1,000 garbage cans within a 50 km radius of their plant. The wash system was designed for 120 – 240 liter transfer bins and 500 liter boxes. This enables the owners to set up a collection system with their neighbours and neighbouring businesses, returning clean bins to their supporters. Also with this investment the entrepreneurial-family Buschhaus generates optimal synergy effects through their use of the biogas heat by allowing the washing system to operate with the heat of three installed CHPs with about 1.5 MWel.

## THE BIOGAS PLANT

- **Commissioning:** 2001
- **Input material:** secondary raw material, flour-dust, food waste, beef liquid manure
- **Information:** Currently ca. 50 % coferment, increasing tendency
- **Digester:** PlanET Ø 21 m, incl. wall and base heating, wooden roof, gas holder
- **Agitators:** 2 PlanET eco® mix 13 kW, PlanET eco® paddle
- **Plus secondary digester**
- **Digestate storage:** PlanET Ø 26 m, commissioning in 2007, incl. wall and base heating, wooden roof, gas holder
- **Agitators:** 2 PlanET eco® mix 13 kW
- **Plus three further digestate storages**
- **CHP 1 - 3:** 526 kW el JENBACHER
- **Gas engine**
- **Pasteurizer 1 - 3:** 5m³, 10 m³, 20 m³ PlanET

The typical everyday life of father and son generally begins with the delivery of the food waste. A short check of each tank is necessary each day. Even the depackaging machines are self-operating, skilled employees are caring about supervision in order to guarantee a smooth operation.

What is the advantage of the Waste-to-Energy plant compared to an agricultural plant? "Completely simple", said Hans-Gerd Buschhaus, "we do not need our own crop

area due to the delivery of the input materials. Moreover it is more economic to dispose the food products reasonably instead of complete disposal of the food products and the high-grade gas yield.



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